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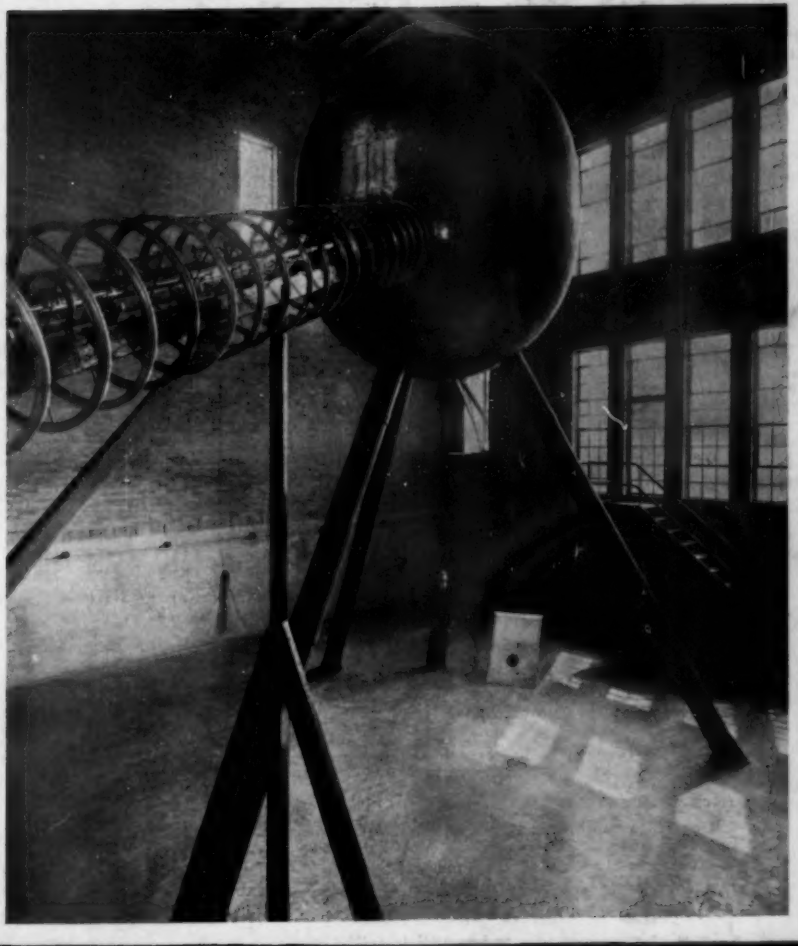
SCIENCE NEWS LETTER

THE WEEKLY SUMMARY OF CURRENT SCIENCE •



JANUARY 30, 1937

Atom Gun

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A SCIENCE SERVICE PUBLICATION

SCIENCE NEWS LETTER

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The Weekly Summary of

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DO YOU KNOW?

A society in England is working to prevent the destructive collecting of eggs from bird nests.

A television station, mainly for experimental work, is to be established in Warsaw, Poland.

More than a ton of dinosaur tracks were stolen with the aid of a compressed air drill, in Holyoke, Mass., recently.

A study of dust storms and their possible effect on health revealed that pathogenic organisms were not actually carried by the dust.

A powerful amber light is a new fog signal for ships, where the St. Clair River flows out of Lake Huron, supplementing the conventional foghorn.

Young men graduating from agricultural colleges in India are being given farm land, so that they may spread their knowledge, by example, to India's farmers.

For the benefit of naval aviation, the National Bureau of Standards has made tests to find the best six-color system for signal lights, and has chosen red, orange-yellow, white, green, blue, and purple as best for this particular service.

A new method of obtaining camphor from turpentine has been reported in India.

The government of Panama is to wage a campaign against malaria in 1937 and 1938.

The Romans placed markers along their main highways, at 1,000 Roman paces apart, or 4,861 English feet.

Before "coal oil" came into use with the Civil War, the chief sources of light were animal fats and whale, fish and vegetable oils.

A floating church has been built in Argentina, to carry the church to people who had difficulty in fording delta streams of the Parana River.

Approximately 3,000,000 bones of prehistoric animals have been taken from asphalt beds of the Rancho La Brea, within the city limits of Los Angeles.

Loss of 342 lives in Japan in the first half of 1936 was reported traceable to potassium cyanide; and appalled by deaths from this poison the Japanese Government is striving to devise means for giving it distinctive odor and color.

WITH THE SCIENCES THIS WEEK

Most articles are based on communications to Science Service or papers before meetings, but where published sources are used they are referred to in the article.

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ANTHROPOLOGY

New Human Relative in Skull "Of Greatest Importance"

Bones Found in East Africa May Be of Distinct Type Of Man, Low in Evolution, Long Since Died Out

A PREHISTORIC human skull that has come to light in East Africa provides man with a brand-new relative for his proud old family tree.

Enthusiastically hailing the skull as "of the greatest importance," Dr. L. S. B. Leakey, noted British anthropologist, gives his opinion that this early African was an entirely different genus of man from any heretofore known.

Dr. Leakey's verdict, if generally accepted, means that an unsuspected extinct branch of the human race is now known; and that this distinct type of man, low in type, was among a number of genera and species of humans who were on earth, but who died out, leaving only the species, Homo sapiens, to which all mankind alive belongs.

The skull represents a man who was "a low type of human with some markedly anthropoid characters," Dr. Leakey declares (*Nature,* Dec. 26). Primitive and uncouth as this man was, he had his day on earth surprisingly late. Although this Stone Age African had the beetling-eye ridges like his shambling, clumsy distant "cousin," Neandertal man, the African represents a generation more than 30 thousand years later than Neandertal Man's own characteristic age. Assigning the new discovery to the early or middle Gamblian period of Africa's geological history, Dr. Leakey is thereby suggesting that the new-found genus of man existed on earth somewhere about 30,000 years ago.

The skull, which Dr. Leakey has examined in Berlin at the Natural History Museum by special arrangement with the discoverer, was unearthed during a scientific expedition to the Eyassi Lake basin in Tanganyika Territory. In the course of the expedition, which lasted from 1934 to 1936, Dr. Kohl-Larsen found parts of three fossil skulls, one of which is the important type of human which Dr. Leakey has pronounced unique in discovery.

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PUBLIC HEALTH

Flu Cases Double But Optimism Is Felt

ALTHOUGH the number of reported cases of influenza doubled during the week of January 11 to 16, there is a feeling at the U. S. Public Health Service that the prevalence of influenza in the nation may be on the down-grade.

One note of concern is what effect the concentration of inaugural crowds in Washington may have on the course of this present outburst. People from all parts of the country came to Washington, were exposed to infection brought to Washington by other visitors, became chilled due to the rainy weather and may return to their homes coughing and sneezing as active spreaders of colds and influenza.

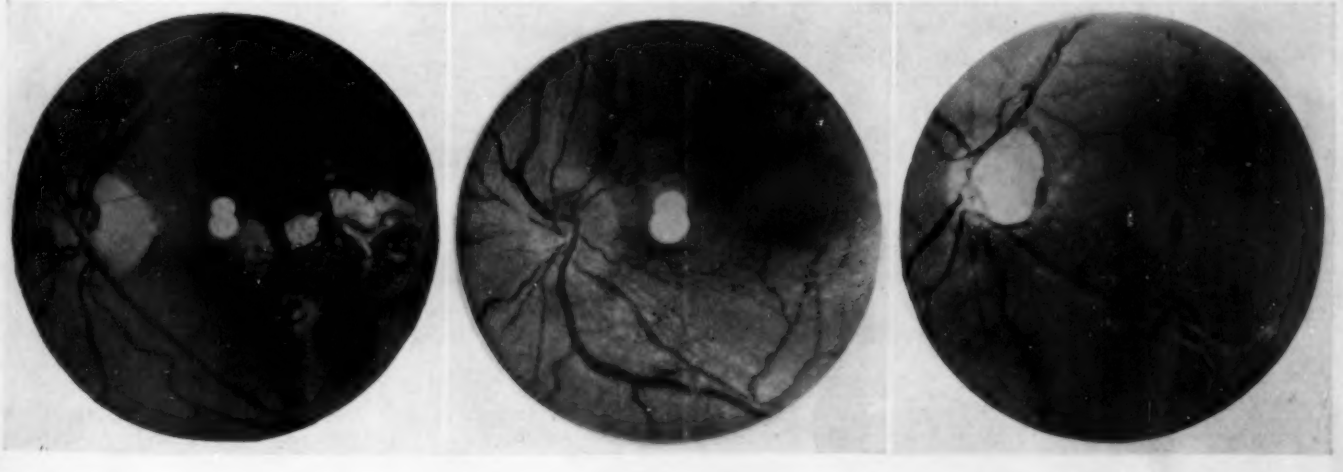
Reports from various states show 23,258 reported cases during the week ending Jan. 16 as compared with 12,145 for the week before. But one cheering fact is that in New York where the disease struck early there is now a decline in cases reported. Not all cases of influenza are reported because doctors are often too busy to get the reports made out. So while the number of cases reported is an indication of relative prevalence there are probably five or more times as many actual cases.

The present outbreak does not approach the epidemics of 1929 and 1933. There were 200,000 reported cases in the first week of January, 1929, and 60,000 in 1933.

The influenza epidemic abroad shows little sign of abating, it appears from a League of Nations' cabled communication received at the U. S. Public Health

EYES FORETELL DEATH

Parents, lovers and business men hope to learn truths by a "Look in the Eye." Physicians have really found that these windows reveal important signs of disease and approaching death. For instance, a look into the eye at left revealed tuberculosis and destruction of the center of sight to Dr. Arthur J. Bedell, of Albany, N. Y., while in the center eye Dr. Bedell found swollen blood vessels, with veins dark and arteries lighter, which revealed high blood pressure in the early stage. This condition, Dr. Bedell says, can be discovered more quickly and more positively by photographic examination of the background of the eye than by any other method. At the right is the eye of a patient who was absolutely unconscious of poor health but who died just 90 days later of the high blood pressure revealed here.



Service. The disease is still spreading northwards in England and threatens to exceed the 1933 epidemic in severity. London reported 311 deaths in one week and other English cities a total of 457 deaths. Pneumonia cases for the week were 2,335.

On the continent, the epidemic has declined in Berlin but influenza mortality increased in Copenhagen and Amsterdam. The epidemic was widespread but mild in Poland, Czechoslovakia and Spain during December.

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ARCHAEOLOGY

Egypt's Oldest Horse Found Buried in Huge Thebes Tomb

Monkey Also Was Carefully Wrapt and Given Human Burial; Housewife Took Clean Sheets to Her Grave

THE LATEST "famous character" come to light in Egypt is Senmut's horse.

When Egyptologists, digging in a ravine at Thebes, found a huge coffin and lifted the lid, they were frankly surprised. A horse!

The horse was undoubtedly as old as the people buried nearby. It must be, then, a fifteenth century B. C. horse, and therefore the oldest horse ever found in Egypt. First horses were brought to Egypt by the Hyksos about 1700 B. C., but no remains of those early steeds have yet come to light.

And if the beast belonged to the famous Senmut, whose parents were buried in the hillside, why, then, that would give the horse added prestige. For Senmut stands out in history as a classic example of the self-made man. Over 3000 years before Horatio Alger's heroes began to glorify the "boy who makes good," Egyptian Senmut was showing how the trick could be done.

Senmut joined the political band wagon following the royal lady Hatshepsut, who had an eye on the throne of Egypt. Hatshepsut seized the throne from her step-son, nephew, son-in-law combined—the usual confusion of Egyptian royal relationships—and made herself not merely queen, but king, with false beard and full kingly honors. And Senmut, who had kept right along with her, became the favorite of the world's first great queen in history.

The Egyptian expedition of the Metropolitan Museum of Art has unearthed Senmut's horse, along with much other evidence about him.

In a report of the latest discoveries, Ambrose Lansing and William C. Hayes, of the expedition, account for the horse receiving special burial:

"The horse was, in the time of Senmut, a recent importation from Asia into Egypt, and it is natural that anyone who owned a horse would have prized an animal so spirited as compared with the lowly donkey, which up to that time had been the only animal of the sort in Egypt.

"At any rate, it is not much of an assumption to consider this a pet horse, nor much more hazardous to assume that it was Senmut's favorite mount."

The Egyptologists found the horse wrapped up in linen just as though it were a human being. They could find no signs, though, that it had been put through any mummifying process.

On its back, among the wrappings, they discovered a saddle. And this is believed to be the oldest saddle yet found. It is a rectangular piece of linen and leather, with a projection toward the rear. Tapes at the front end were tied round the horse's neck, and two longer tapes at the other corners formed a girth. The underside of the saddle was reinforced.

A smaller box found farther along the gully was at first taken for a child's coffin. But again the Egyptologists were surprised. A pet ape!

Identifying the animal as a cynocephalus ape, the Egyptologists say:

"The animal had been carefully wrapped and buried just as though it were a child, and in the coffin had been placed a saucer of raisins. Its owner, whether Senmut or another, had evidently been very fond of his pet monkey."

76 Clean Sheets

In the grave of an Egyptian housewife, buried 1494 B. C., the Egyptologists found 76 clean and pressed fringed sheets.

"Their amazing state of preservation allowed them to be unfolded, measured, and refolded at will," says the report. The sheets are among household supplies discovered in the tomb of Ramose and Hat-nufer, parents of Senmut.

To housemistress Hat-nufer goes the honor of clearing up a mystery date in Egyptian royal history. In her tomb is evidence showing when the feminist

TOMB OF HORSE

The great box in the excavation was opened with great curiosity by scientists who found—a horse.

OLDEST

Remains of Egypt's oldest horse, carefully wrapped in linen cloths, was found in the Thebes tomb of the self-made man Senmut. At the left is the cloth saddle found with the horse—the oldest ever unearthed.

royal lady Hatshepsut took the throne of Egypt and assumed the title of king. This important event happened while Hat-nufer's burial arrangements were going on. Part of the jars are stamped with Hatshepsut's personal name and her title as royal consort. That was before she won the throne in a bold coup. Another jar and on two linen marks on the mummy, however, Hatshepsut is named as king. The feminist queen therefore assumed the throne in the seventh year of the reign of Thutmose III, and the time is narrowed down to the last three and a half months of the year.

Hat-nufer, who died at this exciting time—when her son Senmut was destined to become right-hand-man of the new queen—had no title but House-mistress.

So baled in wrappings was the mummy of House-mistress Hat-nufer that it took the Egyptologists four days to record and remove fourteen sheets, 80 bandages, and other cloths. Inside they found an old woman, short and, though delicately boned, distinctly fat. Her sparse gray hair was tricked out with two switches of false hair made of an enormous number of fine, tapering braids of black, human hair. Her left hand and wrist glittered with signet rings and scarabs. Her coffin was handsomely adorned in black and gold.

Hat-nufer was well-to-do in her own right, the Egyptologists infer. Her husband, Ramose, was a commoner, probably a peasant. So miserably was he buried that he is summed up by the Egyptologists as exceptionally poor and insignificant.

Alluding to Senmut's own flourishing career, and his apparent indifference to his father's burial, Mr. Lansing and Mr. Hayes state:

"Clearly, the style with which an ancient Egyptian was buried depended on his own state of prosperity at the time of his death rather than upon the filial piety of his children, which, however elaborately protested it may have been, did not, in this case at least, include the outlay of benefits of a material nature."

One basket in Hat-nufer's array of possessions is revealed as containing bread and fruits.

"The bread is of two kinds," the Egyptologists report, "one light brown with a hard, glossy crust like that of modern Vienna rolls, the other dark, grayish brown, with a rough surface." One type of loaf is shaped rather like a human figure, and there are lumps of black matter containing raisins in the basket, "which look as wedding cake might if kept for three thousand years."

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BIOCHEMISTRY

Fate of Alcohol in Body Challenges Wit of Chemists

THE ALCOHOL that gets into a man's body after a cocktail party or on other occasions may be burned like food and thus disposed of. More likely, however, it is changed into some other substance which is either stored or used by the body.

The exact solution of this problem of what the body does with alcohol remains a challenge to physiological chemists, it appears from the report of Dr. Thorne M. Carpenter of the Nutrition Laboratory of the Carnegie Institution of Washington.

Dr. Carpenter described in a lecture at the Institution his own experiments which "point to the conclusion" that instead of being burned in the body, alcohol is converted into some other substance which may then be either stored or used.

Alcohol itself cannot be stored by any organ, he said. The amount present in any organ after drinking depends chiefly on the amount of blood circulating through the tissues of that particular organ. The highest amount of alcohol per unit of weight goes into the blood, after it has been taken into the body, and nearly as large an amount per unit of weight is found in organs well supplied with blood such as brain, kidneys, spleen, heart, lungs and liver.

What happens to the alcohol between the time it gets into the blood and organs and the time it disappears from the body is the question scientists have yet to settle, it appeared from Dr. Carpenter's talk.

Hormones, produced by the glands of the body, may be concerned in this alcohol question. Injections of insulin, the diabetes remedy, make alcohol disappear very much faster than normal from the bodies of animals, other investigators have found. In fact, the disappearance is so fast that it does not seem possible it could be due solely to burning of the alcohol. Other conditions besides an excess of insulin may make alcohol disappear quickly, Dr. Carpenter suggested, adding that further investigation along these lines is needed.

The idea that exercising helps the sobering-up process by speeding the removal of alcohol from the body got a

set-back in Dr. Carpenter's studies. Performance of muscular work did not hasten materially the disappearance of alcohol from the bodies of the men who drank measured amounts of alcohol for Dr. Carpenter's experiments. An hour's work on the ergometer did not work off all the alcohol, his measurements showed. The only effect work or exercise could have would be to remove some of the alcohol by simple vaporization through the breath. But not very much alcohol is dissipated this way. Dr. Carpenter said that any such attempt to remove alcohol through increased ventilation "would require a perfect whirlwind through the lungs in order to be really effective in diminishing the amount of alcohol in the body."

Getting rid of alcohol by drinking large amounts of water also does not, in the light of Dr. Carpenter's experiments, seem a successful method. Gallons of water would have to be taken immediately after the alcohol, he found, in order to flush the alcohol out of the body. The amount of alcohol gradually diminishes by itself, he explained, and "there would be no point in taking large quantities of fluids when the alcohol had reached a low point."

Other interesting points about alcohol were described by Dr. Carpenter. It is absorbed very rapidly, distributed very rapidly through the body, and has the unique characteristic of being identifiable in the body as long as any of it is left. Alcohol furnishes energy, the amount being between that furnished by fat and that furnished by sugars and starches. It can get into the body without being drunk, being very readily absorbed from the air by breathing. Dr. Carpenter made use of this characteristic in some of his studies with chickens. The chickens were placed in an atmosphere saturated with alcohol so that they inhaled some with each breath and thus accumulated it in their bodies.

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ARCHAEOLOGY

Earliest American Girl Was Drowned, Not Stabbed

AMERICA'S oldest murder mystery is closed.

Drowning was the fate of the earliest known American girl, who died while out on a Minnesota lake. The accident happened about 20,000 years ago, according to the date estimated by Prof. A. E. Jenks of the University of Minnesota, and the girl's skeleton he pronounces the most ancient human remains yet revealed on this continent.

When dug up in 1931, the girl's skeleton was marked by a cut in the right shoulder blade, and this was thought to be the death wound caused by dagger or arrow. A dagger was found near the skeleton.

Now, however, in a formal published report on the skeleton, which he has studied with great care, Prof. Jenks announces that the shoulder cut proves to have been made by a shovel during the first rescue work. The Minnesota girl came to light when state highway workers struck a layer of silt formed in the last stages of the glacial age, and found in it bones of a human being.

The skeleton continues to be known for convenience as Minnesota Man, Prof. Jenks explains, since that name has become attached to it, but there is definite evidence that Minnesota Man was a girl. Various traits of body and skull testify to the sex.

When she died, the girl was about 15 years old, Prof. Jenks concludes from the fact that she had cut all teeth except the wisdom teeth, and from the still immature state of the long bones of the body.

The teeth of this early American girl are larger than those of ten Old Stone Age types famous in scientific records.

Prof. Jenks sums up that the traits of the skeleton "proclaim it to be a primitive *Homo sapiens,* of an early type of evolving Mongoloid, already prophetically suggesting American aborigines, especially the Eskimo, more than the present Asian Mongoloids."

Geological evidence for the time when the girl lived and died is summed up in the report by Dr. George A. Thiel of the University of Minnesota. He regards glacial Lake Pelican, where the skeleton was found, as about 2,000 years older than famous Lake Agassiz of the glacial period, and therefore the skeleton and its earthen bed are assigned to an antiquity of 20,000 years.

If generally accepted by geologists and anthropologists, this interpretation of Minnesota Man's antiquity will give America a longer human history than some scientists have been willing to concede. It has been one theory that man did not arrive in America via Bering Strait until after the last ice sheet retreated, clearing the way. To reconcile this theory with the evidence that hunters in this country actually shot mammoths and other Ice Age animals, it has usually been suggested that the animals survived their own glacial era, perhaps by some thousands of years.

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PSYCHOLOGY

Fascist Attitudes Found In America's Midwest

A PARALLEL between conditions in Italy and Germany that brought Fascist dictators to power and present conditions of thought in the United States has been traced by a psychological study just made public.

Using an "opinion scale" made up of the same questions found to be revealing in a study of Fascism in Germany and Italy, Dr. Ross Stagner, of the University of Akron, has studied the political ideas and prejudices of about 500 men and women from the Main Streets of America. Of these about 100 were college students, 100 adults from rural Minnesota and about 300 from the Chicago region, including unemployed persons, shop workers, office workers, and business and professional men of all kinds.

Direct questions like "Are you a Fascist?" or "Do you approve of Nazi Germany?" had no place in the tests for there is too much stereotyped thinking about Fascism in Nazi Germany and in Italy, Dr. Stagner found.

"Seventy-three per cent. of the population endorsed a position of strong disapproval (of Germany)," he said. "Most of this 73 per cent, did not know anything about what has really happened in Germany. They have heard certain atrocity stories—many are Jewish, and know personally of the persecution of their relatives—and without further ado they indicate strong disapproval." (*Jour. Social Psychology,* Nov.)

A more subtle method was used by Dr. Stagner to elicit the true opinions of the individual. "Opinions about the Depression" was the title of a list of statements for which each person was asked to indicate agreement or disagreement.

First on the list was the innocuous comment that "Conditions are likely to

get better during the coming year," which was merely a blind for the real purpose of the inquiry. Here are a few of those that really did bring out the trend of thought in the group

"The people who complain most about the depression wouldn't take a job if you gave it to them." "Most people on relief are living in reasonable comfort." "The government must first balance the budget." "Unemployment insurance would saddle us with a nation of idlers."

Sympathetic attitudes toward Fascist doctrines, it was found, are strongest among the wealthy and among the poor. The opposition is in the middle class—those with a family income between $1,000 and $5,000. Dr. Stagner sees in this fact a parallel with conditions in pre-fascist Italy and Germany, before the conversion of the middle classes to Fascism.

"In both Germany and Italy, the middle classes (land owners, retail business men, small manufacturers and well-to-do professional groups) found themselves threatened by a growing monopoly capitalism from above and a growing revolutionary disposition from below which presaged the abolition of all private ownership of capital goods," he said.

"These economic groups attempted to defend themselves by dictatorship, by breaking up labor unions, by attempting to regulate monopoly capital, abolishing political parties and building up intense nationalism. The finances for these movements have been shown to come from the upper income groups and the 'fascist militia' from the lowest income groups, in interesting parallel to our observations.

Effective Here

"It will be recalled that it was by holding up the bugaboo of political radicalism as a threat to the status of the middle class that both Mussolini and Hitler obtained power," Dr. Stagner added. "It is more than apparent—it is striking—that the same technique will be very effective in this country."

What Americans make up the group of those sympathetic to Fascism? Generally they are the small business man, the office worker, the high-class professional man, the home owner, Dr. Stagner found. Politically, the old-time Republican supporter of Hoover is most likely to have a Fascist leaning. Next come the supporters of Roosevelt. Last come the Socialists and Communists.

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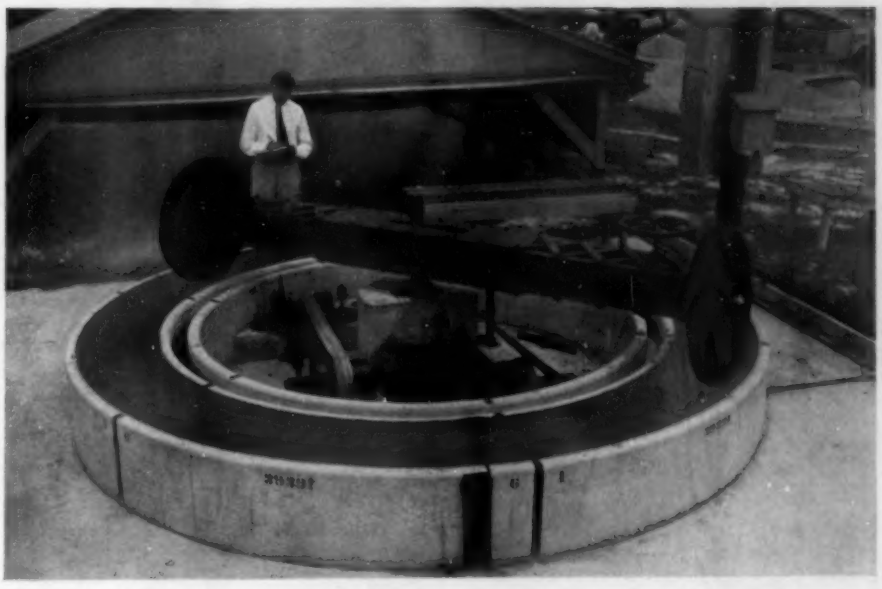

ROUND AND ROUND

ENGINEERING

Going in Circles But Really Getting Somewhere

THE POPULAR belief that you never get anywhere going around in circles is being disproved at the Arlington testing laboratories of the U. S. Bureau of Public Roads, where two automobile wheels rotating on the surface of a small circular track are revealing the relative stabilities of various low-cost road surfaces. There are two of these apparatus, one indoors and the other out, with five or six sections of different bituminous mixtures making up the surface over which the wheels rotate.

Tests are made of one variable factor at a time, such as the quantity or the consistency of the bituminous mixture, and are run until the relative wear on each section reveals the comparative stabilities which result with regard to the several circumstances of the variable. The wheels, which exert a force of 800 pounds on the road surface, are mounted on the ends of a centrally pivoted steel beam which can be driven at three speeds, the maximum being 9 miles per hour.

The track itself, laid in a concrete trough, is approximately 37 feet in circumference, 18 inches wide, and has a mean depth of 12½ inches. Distribution of the "traffic" over the width of the surface during compaction is made possible by shifting the pivotal point of the steel beam back and forth by means of a hand-operated wheel, or, in order to accelerate the tests by simulating conditions of high traffic density, the pivotal point may be set off center so that the wheels travel in two concentric lanes 5 inches apart.

The surfaces may be tested dry or flooded, or the subgrade, which consists of gravel or crushed stone, may be kept moist by the capillary introduction of water through the base of the inner wall of the track.

From the effects produced on the test specimens by these revolving wheels, which travel about 8,000 miles per year, engineering improvements are being developed which the motorist will realize in the construction of better highways.

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Wild turkeys were so plentiful in ancient Mexico that the Aztecs fed 500 turkeys a day to birds of prey in the zoo at their capital.

The Swedish match industry is offering a new waterproof match head in which synthetic resin is used as the binder for the inflammable composition.

BACTERIOLOGY

Analyze Germs In Search For Plant Cancer Causes

A PHOSPHORUS-containing material, relatives of which are found in the human brain and liver, has been isolated by Drs. Erwin Chargaff and Michael Levine of the College of Physicians and Surgeons at Columbia University and Montefiore Hospital from the body of a bacillus that causes tumors in plants.

In plants there is a well-known disease, the crown-gall, which bears a slight resemblance to tumors in animals. It is produced by the Bacillus tumefaciens.

Using the chemical methods developed by Dr. R. J. Anderson of Yale University, who recently purified an acid from tubercle bacilli which produces symptoms of tuberculosis itself when injected into an animal, they are engaged in analyzing the crown-gall germ.

Their first results show that it contains a phosphatide which stimulates rapid cell multiplication in plants. They are now working to learn the exact constitution of this chemical. Some similar materials have long been known to be of extreme importance to the normal function of plant tissues as well as animal ones.

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MEDICINE

Study of Cancerous Mice Shows "Tumor Disposition"

MICE with an inbred susceptibility to cancer have a "tumor disposition." Evidence for this and characteristics of the tumor disposition are reported by Dr. J. E. Davis of the University of Chicago (*Canadian Medical Association Journal,* January).

The tumor disposition investigated by Dr. Davis is not psychological but chemical. It refers to the way animal tissues use oxygen for the energy interchanges that are constantly going on in the body. Such chemical studies of tissue activity are being made by scientists all over the world in the hope of discovering the fundamental difference between cancer tissue and normal tissue and thus learning what causes cancer and how it may be prevented.

The term tumor disposition was first suggested by Dr. W. Buengeler in a report to a German scientific journal. Confirming Dr. Buengeler's observations, Dr. Davis found that bits of tumor tissue, liver, abdominal muscle and lymph nodes taken from mice of the cancer or tumor strain used less oxygen than similar tissues from mice of a non-cancer strain. Along with the lower oxygen consumption of the tissues of their bodies, the cancer-strain mice had larger livers, fewer red blood cells, less hemoglobin and lower red cell volume.

The cancer-strain mice also had more calcium (the kind of lime that makes bones hard) in their soft tissues.

These differences, Dr. Davis believes, are not the result of cancer but predispose to it. These, and possibly other factors, make up the tumor disposition. Dr. Davis concludes that in the cancer-strain mice the presence of calcium in the tissues suffering from oxygen deficiency may have been the deciding factor as to whether a tumor would or would not result.

His studies were made on cancer-strain mice with and without tumors and on mice from a non-cancer strain.

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AGRICULTURE

Summer-Planted Spuds Yield Well in Russia

POTATOES are traditionally supposed to be planted in spring, as early as possible; yet in southern Ukrainia it has been found more profitable to plant them in summer.

This discovery was made by T. D. Lyssenko, Soviet agricultural investigator whose "vernalization" of seeds to make them grow faster and yield more heavily has already given him a wide reputation.

The potatoes used in Mr. Lyssenko's new method of cultivation are not subjected to the special treatment which he gives to seeds, but are simply planted late. The Academy of Sciences of the U. S. S. R., which sponsors his work, states through a Tass news report, that potatoes thus planted are less subject to the destructive action of heat and drought and that the yield is increased. Despite late drought last summer, yields as high as 50 tons per hectare were reported. (A hectare is 2.47 acres.)

Quality improvement also is claimed, and the resulting crop is said to be better for seed-potato purposes as well. The first large-scale use of the Lyssenko late-planting system was during the summer of 1936, when a total of 18,000 hectares were planted in southern Ukrainia. For the coming summer, plans call for the planting of 61,500 hectares.

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IN SCIEN

PHARMACOLOGY

Iodine In Water Pronounced Best Antiseptic for Cuts

THE best antiseptic for treating wounds, cuts and abrasions is a solution of iodine in water.

This is the conclusion of Dr. Robert N. Nye of the Mallory Institute of Pathology, Boston City Hospital, who has completed a series of experiments on certain commercial and non-commercial solutions ordinarily used as antiseptics for minor wounds and for irrigations. (*Journal, American Medical Association,* Jan. 23.)

Four solutions containing iodine, seven containing mercury, two containing chlorine and three miscellaneous solutions were tested at the same time.

On the sixteen antiseptics five comparisons were made: (1) bactericidal activity, (2) bactericidal activity in mixtures containing 50 per cent horse serum (3) diffusibility, (4) toxicity, and (5) cost.

"The superiority of iodine as an in vitro (in a glass) antiseptic is obvious," states Dr. Nye in the medical journal. "The bactericidal strength of any iodine solution is directly proportional to its free iodine content."

Iodine was the only antiseptic of the series that retained its bacteria-killing power in the presence of an equal amount of serum. It possesses a high degree of penetration and is not unduly toxic for human white blood corpuscles, Dr. Nye declares. In dilutions suitable for their particular purposes it is inexpensive.

Dr. Nye asserts that some opposition to the use of iodine has developed because it is usually employed as the standard (7 per cent) or half strength (3.5 per cent) tincture. Such a solution is painful to apply and is irritating to the tissues, partly as a result of its high iodine content and partly because of the alcohol.

Iodine in a solution of water rather than of alcohol can be used to advantage, he says. A 1 per cent or even a 0.5 per cent aqueous solution can be used for wounds, cuts, abrasions and irrigations.

Science News Letter, January 30, 1937

NE FIELDS

ARCHAEOLOGY

Chinese Had Children Seek Imaginary Isles

SOME of the world's strangest exploring expeditions have been tried by the Chinese.

Thousands of boys and girls were sent out into the eastern sea over 2,000 years ago to hunt for the Three Isles of the Blest, says H. H. F. Jayne, director of the University Museum, University of Pennsylvania.

Emperor Shih Huang-ti, famous builder of the Great Wall, sent the youthful explorers to find out about a legend that the immortals dwelt on the Three Isles. The emperor also ordered the boys and girls to bring him a precious drug that would prevent death, supposed to grow on the isles.

A little later, Emperor Wu-ti sent expeditions for the same purpose, and went so far as to go to the seaside himself, hoping royal eyes might discern the peaks on the isles. But even with aid of his magicians, he saw nothing, and had to content himself with building a huge artificial lake with three mountainous islands and the birds and beasts and palaces supposed to be on the islands.

Science News Letter, January 30, 1937

ANTHROPOLOGY

Fossil Ape Bones Show New Human Resemblances

NEW points of resemblance between man and the recently discovered higher-ape fossils of Sterkfontein have been worked out by their discoverer, Dr. R. Broom of the Transvaal Museum, South Africa, as he has cleared away more and more of the bone from its encasing stony matrix.

New details of the cheek bone, thus made visible, show that the animal had less of an ape-like snout and a straighter, more "human" facial angle than Dr. Broom had at first supposed. The eyeteeth are relatively small, and there is no gap between them and the first pre-molars — again a man-like rather than an ape-like character.

In general, says Dr. Broom, the new findings support the earlier opinions of both himself and Prof. Raymond A. Dart of Witwatersrand University, that this extinct genus of apes, though unquestionably real apes and not men, were not related to any living type of great apes and show a closer approach to the human physical makeup than do any other known apes.

Dr. Broom considers his specimen to be sufficiently different from the much more ancient one found by Prof. Dart to justify a separate name for it. He proposes the zoological title *Australopithecus transvaalensis*.

Since first reporting discovery of skull fragments, brain cast, and teeth a year and a half ago, Dr. Broom has also found bones of most of a hind leg, the base of a spinal column, and one bone of a pelvic girdle. These are still embedded in the stony matrix, awaiting the tedious job of drilling, chiseling, and scraping them free. As soon as he can find time to do this, he expects to be able to form some idea of the animal's posture in walking—whether stooped far forward like an ape, or more nearly erect like a man.

Science News Letter, January 30, 1937

ORNITHOLOGY

Reptile-Clawed Bird Sought for Museum

ON a search for a rare and strange bird which demonstrates that birds descended from reptilian ancestors millions of years ago, Emmet R. Blake of Chicago's Field Museum of Natural History sailed from New York on Thursday, Jan. 28. The bird is the hoatzin, found only in the inundated forests of northern South America. Its fledglings have reptilian claws which they use with great agility in climbing in and out of their nests. Later the claws are lost.

Science News Letter, January 30, 1937

ENGINEERING

Inflate Tires With Water—Advocated By Maker

INFLATING the rubber tires of tractors partially with water is being advocated by a tire manufacturer to improve traction in rough uneven ground. You use a special dual water-air nozzle and put in water until it comes to the nozzle level. Then you fill the tires with air up to their regular pressure. In freezing weather a solution of calcium chloride can be used.

Science News Letter, January 30, 1937

BIOLOGY

Earthworm in Tree Reported to Smithsonian

AN EARTHWORM that lives in a tree has been discovered by a Smithsonian Institution collaborator, H. G. Deignan, who has just sent in over 600 birds also collected in northern Siam. The tree-dwelling earthworm was sent to India for identification by a scientist now there.

Science News Letter, January 30, 1937

ZOOLOGY

U. S. Breeds Own Huskies For Dogteams in Alaska

ADVENT of the airplane in Alaska, and resultant air-mail contracts, have produced in the past few years a diminution of the supply of huskies available to pull dog teams. The result is that park authorities in Mount McKinley National Park are raising their own dogs, reports Superintendent Harry J. Liek.

Previous to the use of air-mail, mail delivery was mainly by dogteam throughout the territory, so that the breeding of huskies was a thriving business. Now that the dogteam delivery has been discontinued in most sections, huskies are scarce and difficult to purchase.

The dogteam still remains the winter mode of transportation in Mount McKinley Park, however, hence the decision to breed huskies in the park for government needs.

Fourteen pups raised in the park during the summer now are in excellent condition and large enough to work. The rangers using them report faster travel with the young dogs than with the older members of their teams, and it is hoped that a good strain of husky may be developed. An average of about 40 dogs for sled use is maintained.

A well-trained leader of a dogteam can follow an old trail although covered with snow, according to Superintendent Liek. Although the driver of the team may be in doubt as to the location of the trail, the lead dog invariably finds it. The average load per dog is 75 pounds on a good trail, and the stamina of these animals in heavy hauling on steep grades is remarkable.

Rangers using dog patrols become much attached to their huskies, and replace them with reluctance when old age makes this necessary.

Science News Letter, January 30, 1937

ASTRONOMY

On Time

Clocks and Sun-Dials Fail to Keep Step Because of Variations in Speed and Direction of Earth's Motion

By JAMES STOKLEY

ONE of the oldest of time-keeping devices is the sun-dial, which existed, in a primitive form, among the ancient Egyptians. Even when mechanical clocks came into use, about the middle of the 14th century, the sun-dial was not immediately displaced because the first clocks were extremely crude. One that was accurate to within an hour a day was considered extraordinarily good. In 1658, however, the Dutch astronomer, Huygens, introduced the pendulum for controlling clocks and the accuracy was immediately vastly increased.

Then the errors of the sun-dial became more apparent. It was found that the clocks and dials did not keep in step, but sometimes one was fast, sometimes the other. This was true for an accurately running clock, that is, one which always showed the same length for the hour or any other unit of time. If you have a sun-dial available and can compare it with an accurate watch, you will find that this month, on Feb. 11, the watch is 14 minutes 23 seconds fast of the dial, greater than at any other time of the year. This is not the greatest difference between the two, however, for on November 3 you will find that the dial is fast by 16 minutes 23 seconds.

Equation of Time

This constantly varying difference between the clock and dial, known technically as the "equation of time," is a result of two things. First, the equator of the earth, the line at right angles to the axis on which it spins, is not in the same plane as the path in which the earth encircles the sun once a year. Secondly, the earth does not maintain the same distance from the sun as it goes around it.

If it were possible to see the stars and the sun at the same time, and we looked at them each day, we should find the sun gradually moving eastward among them. This is an effect of the annual motion of the earth in its orbit, and gives us two different kinds of time, depending on whether we take it from the stars or the sun. The former is called sidereal time, and is used only by the astronomer.

The difference between them can be understood if we think of the sun and a certain star being in exactly the same direction, and directly south; the hour is 12 noon. Because of the daily spinning of the earth they both seem to move across the sky from east to west, and after one turn of the earth they are south again. But in this time the earth has also moved about one three-hundred-and-sixty-fifth of its journey around the sun. The sun therefore has apparently moved eastward from the star, they are no longer in the same direction. Consequently, the earth has to turn about four minutes longer before the sun again is south or on the meridian. Thus the solar day is about four minutes longer than the sidereal day.

Varying Rate

Because of the angle between the earth's equator and its path around the sun, that body does not move eastward at a uniform rate. In June and December it is moving directly east—all its motion is used in causing a delay of its crossing the meridian. But in March it is moving northwards as well; and in September it is moving to the south, hence it does not travel to the east as rapidly and the delay is less.

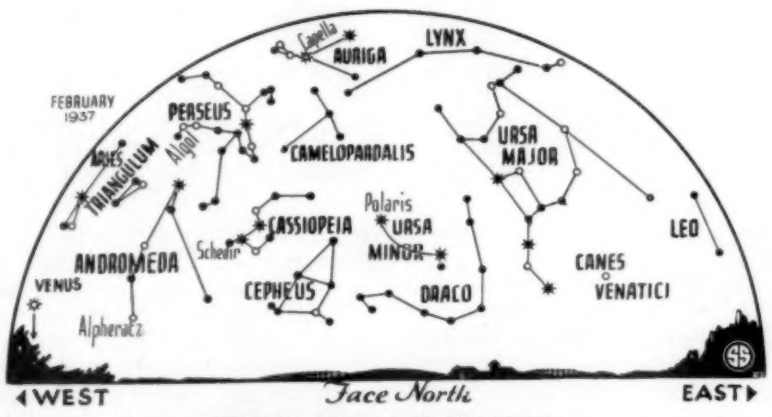
This is one factor. The other is a result of the fact that the nearer the earth is to the sun, the more rapidly we move in our orbit. In January, therefore, when the sun is nearest, we move around it at a faster rate than at any other time of year. The earth, then, goes farther in its orbit while it turns once, the apparent daily motion of the sun to the east is greater, and the delay in crossing the meridian is greater.

Long at Christmas

These two variations combine in such a way that the longest day (as measured from the time it takes the sun from one meridian crossing to the next) comes about the time of Christmas. Then the day is nearly half a minute longer than average. In September it is shorter than average by almost the same amount. From the middle of February to the middle of May, and from the end of August to the beginning of November, the days are short. During the rest of the year they are long.

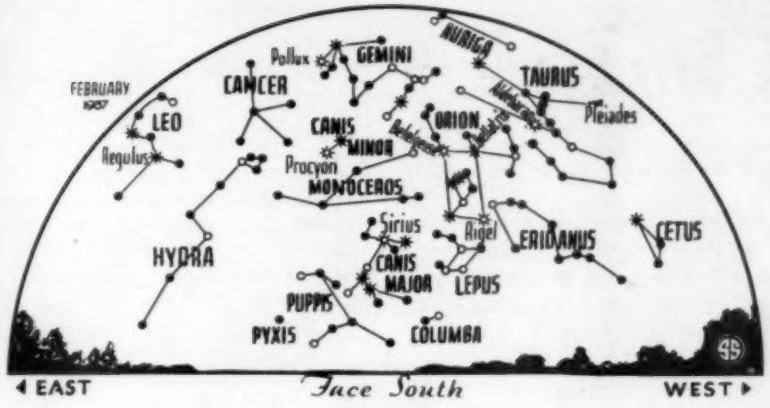
Now we can understand the effect on the clocks, and why they differ from the sun-dial. About Christmas Eve, the two were together, but the solar days were very long and each day the sun dropped behind a little, so that they got more and more out of step. Now the days are still longer than average and the clock is still gaining on the sun. On February 11, however, the day will

☼ ✱ ○ • SYMBOLS FOR STARS IN ORDER OF BRIGHTNESS



INCREASING BRIGHTNESS

Venus shining in the west after sundown will grow more brilliant as it draws nearer until March 12 after which it will rapidly fade as it comes between the earth and the sun.



SIRIUS

Brightest of the stars is the dog-star in Canis Major.

be just 24 hours in length, and after that it will be shorter than average. Then the sun will gain on the clock. This continues, back and forth, during the year. The result is that the clock, during 1937, is ahead from the beginning of the year to April 15. The sun is ahead from that date to June 13 when the clock is again in the lead. But it does not hold it for long. On September 1 the sun takes the lead, gaining until November 3. After that it starts losing, but the clock does not get ahead until Christmas Day. These dates differ slightly from one year to the next, but they are typical.

Of course, it would be possible to make a clock that would gain at certain times of year and lose at others, and, in fact, they have been constructed. But it is much more convenient to have one that runs always at the same rate, so that an hour in December will be the same length as one in September, and that is the way our clocks operate. On the other hand, the ingenuity of inventors has resulted in several sundials that indicate clock time, but, like all of their species, they only work in sunny hours.

Most Conspicuous

The most conspicuous object in the evening sky during February will be the planet Venus, shining in the west. For several months it has been drawing east of the sun, and on February 7 will be at its greatest distance, setting longest after sunset. Then it will approach the sun again, but it will continue to brighten, for, at the same time, it will be swinging around on the side of the sun nearest the earth. At the beginning of February, its distance is some 66,000,000 miles, but on March 1 it will be less than 40,000,000 miles away. As it gets nearer, its brightness increases, until March 12, after which it will rapidly fade as it comes between the earth and sun, lost in the glare of the latter body.

Since Venus is a planet like the earth, its only light comes from the sun, and at the same time the illuminated hemisphere will turn away from us. At 5:50 p.m., Eastern Standard Time, on February 14, the moon, then a young crescent, passes Venus, about 6 moon-diameters to the north. On the evening of that date the two objects will form a striking sight.

Saturn Visible

Saturn is also visible in the evening next month, though nearer the sun than Venus. It is not indicated on the maps because it sets earlier than the hours for which they are drawn (i.e., 10:00 p. m. on February 1, 9:00 p. m. on the 15th, and 8:00 p. m. on the 28th). But if you look to the west, about 7:00 p. m. at the beginning of the month, you will see it almost directly below Venus. It is considerably fainter, though brighter than any star in that part of the sky. As for the other planets, Mars, prominent on account of its red color, appears in the east soon after midnight. Jupiter, towards the end of the month, will be visible low in the southeast, just before sunrise. Mercury will be a morning star, visible in the eastern twilight before dawn, for a few days about the 7th.

The stars, each one a glowing globe of gas, like our sun but millions of times farther away, shine brilliantly this month. Brightest is Sirius, the dog-star, in Canis Major, the great dog, to the south. Above and to the right is Orion, the warrior, with two first magnitude stars, Betelgeuse and Rigel, as well as a number only slightly less conspicuous, such as the three in a row that form the warrior's belt. Still higher and farther west is ruddy Aldebaran, in Taurus, the bull.

Above Canis Major is Canis Minor, the lesser dog, with Procyon, and above him are the twins, Gemini, with bright Pollux. Almost directly overhead, at the times of the maps, is Capella, in Auriga, the charioteer. The eighth star of the first magnitude now visible is to be seen in the east—Regulus, marking the constellation of Leo, the lion.

The familiar great dipper stands in the northeast, its handle downwards, and the pointers, indicating the direction of Polaris, the Pole Star, above. Cassiopeia, the queen, shaped like a letter W on its side, the top to the right, is at about the same height to the northwest.

During February the moon is farthest from the earth, or at "apogee," on February 3, at 7:00 a. m., with a distance of 251,220 miles. It is closest, at perigee, on the 15th, at 3:00 p. m., 229,290 miles from us. Its phases are indicated below:

Phases of the Moon

		Eastern Standard Time
Last Quarter	Feb. 3,	7:05 A. M.
New Moon	Feb. 11,	2:34 A. M.
First Quarter	Feb. 17,	10:50 P. M.
Full Moon	Feb. 24,	2:43 A. M.

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PHYSICS

Notre Dame University Has New Atomic Gun

See Front Cover

AN electrostatic type of high voltage generator with which scientists hope to create the tiny elemental particles known as positrons has now been installed at the physics laboratories of the University of Notre Dame. Under the direction of Prof. G. B. Collins, two graduate students, R. J. Schager and A. L. Vitter, have built the giant apparatus shown on the front cover of this week's SCIENCE NEWS LETTER.

Voltage is conveyed up to the large 12-foot diameter electrode on the belt in the foreground. The accelerating tube down which electrons will be driven by the 1,500,000 volt potential is at the left. The size of the equipment is realized by comparison with the scientist standing below.

Science News Letter, January 30, 1937

PHYSICS

"Yawn" and a Big Stretch Improves Rayon Fabrics

JUST as a wide open yawn and a healthy stretch awakens dormant strength in the human body, so textile chemists have discovered that by making acetate rayon (one of the newer artificial silks) "yawn" and then giving it a long stretch, it doubles and triples its strength.

Not only that, but they can make the acetate rayon fabrics more resistant to hot water and soap liquors so that it retains its luster and strength on laundering. A. J. Hall, British textile chemist, made the discovery and has patented the method (No. 1,709,470).

Since then the acetate rayon textile industry has carried out much additional research work, and numerous patents have recently been taken out on all sorts of improvements on Hall's discovery.

Today rayon manufacturers are increasingly using stretch as a force by which their products can be improved. And because of it milady now wears stronger, more wearable and beautifully dyed rayon fabrics.

Say the textile finishers: If a cellulose acetate fabric has become delustered, "yawn it" and stretch it. Presto! The luster comes back. Is it weak? "Yawn it" and stretch it and you get new strength. Do you want to get novel dyeing effects in the fabric? "Yawn it" and stretch it. Interested in making crepe? Then take the yarn, twist, "yawn it," stretch it and finish twisting.

What is this "yawn it"? It's a sort of loosening up, a relaxation, of the internal forces of the fiber so that they become reduced and permit the yarn to be stretched, sometimes as much as five times the original length.

Yawning is accomplished by steeping the yarns and fabrics in chemicals like acetone, and acetic acid (familiar in the form of vinegar) which swell the yarns and make them soft and plastic. In this state the yarns can be stretched way out like so much taffy. Pairs of rollers, some moving faster than others, produce the stretch as the yarn speeds rapidly through the apparatus.

Formerly the susceptibility of acetate yarns to stretching was regarded by rayon dyers and finishers as a big disadvantage. Today they thank their lucky stars for it because they have learned how to put it to work in producing new fabrics.

Science News Letter, January 30, 1937

PHYSIOLOGY-PSYCHIATRY

Fitness Test for Aviators Used on Mental Patients

A PHYSICAL test linking the airplane pilot who has gone stale and lost his nerve with the mental patient who has developed "anxiety states" and can no longer stand up to the problems of life has now been found.

During the World War, aviators became familiar with the test contrived by Prof. E. C. Schneider of Wesleyan University to reveal "unfitness." They hopped up on chairs and down again, and had pulse counts and blood pressure readings made while standing and while reclining at ease. The pilots who were excessively fatigued or who had "lost their nerve" often rated below 7 on the Schneider scale for which the bottom was minus 5 and the top plus 18. Thus it was found that the jittery aviator really suffered from inefficiency of his heart and circulation system.

Use of this same Schneider index to reveal the physiological unfitness of those who have "lost nerve" in facing life is now reported by Drs. Ross A. McFarland and James H. Huddleson of Columbia University.

The worried and anxious got lowest scores on tests given to over a thousand different individuals. Those diagnosed as psychoneurotic—suffering from anxiety states, neurasthenia and hysteria—averaged only 7.8 on the scale. More than half the men psychoneurotics and nearly three-fourths of the women scored below 10. Patients with mental diseases like schizophrenia and manic-depressive psychoses averaged a little higher, 8.5. Those with organic diseases such as epilepsy or migraine scored 10.2.

For comparison with these abnormal persons, 134 athletes from Columbia University's track, swimming and basketball squads were also tested. They averaged 14.8. A "run-of-the-mine" group selected at random made an average score of 12.6.

Organic Basis

The fatigue and exhaustion of the neurotic patient has an organic basis, these tests show, and are tied up with heart functioning just as is the aviator's "case of nerves." Sometimes friends, and even physicians, of neurotic patients wonder whether their worries and hysteria are not just "put on." A few thought to be malingering were tested by Drs. McFarland and Huddleson. Scores were revealing, averaging only 10.0 compared with the athlete's fitness rating of 14.8 and the 7.8 of the group certainly psychoneurotic.

Chronic emotional strain and stress of neurotic patients eventually impairs their circulatory system, unfitting them to meet the demands of life. This is the conclusion of Drs. McFarland and Huddleson (*American Journal of Psychiatry*, Nov. 1936).

It is difficult to say whether the unfitness is related to a hereditary predisposition brought to a head by precipitating emotional and mental conflicts, or whether the conflicts themselves are enough to account for the improper functioning of the circulatory system.

The scientists feel that the upset to heart and circulation probably goes back of the contributing causes of worry and fear to a basis in heredity.

Science News Letter, January 30, 1937

STANDARDS

New Definition of Noise By Standards Association

MOST textbooks define noise as a sound without definite pitch produced by an irregular succession of vibrations, but acoustical engineers have just set up a new classification according to the American Standards Association. Noise is now known as "undesirable sound," while a new term "unpitched sound" describes the textbook version of the term.

Science News Letter, January 30, 1937

NATIONAL PARKS

NATURE RAMBLINGS

by Frank Thone

A Million Acres of Peace

SCIENTISTS and government officials of the United States and Mexico are examining the possibilities of a proposed International Peace Park in the Big Bend country of the Rio Grande. If established, it will comprise 1,200,000 acres of United States and Mexican land, a virgin wilderness inhabited only by native species of plants and animals, a sanctuary of peace for these children of nature and a monument to the will toward peace now shared by the two nations. It will be a southern counterpart to the already existing international area on our northern boundary, where Glacier National Park adjoins a great Canadian National Park.

The Big Bend region seems well suited for the purposes of a national park, and appears to meet the rather exacting standards held up by the U.S. National Park Service. It is a circle of wild mountains, lifting themselves up to 10,000 feet above a surrounding desert and semi-desert region. The mountains split themselves into awesome canyons, lift their tops to command thrilling hundred-mile views over mesa and river-valley.

It is a biological island, comprising three separate life-zones as recognized by ecologists, with cactus-covered plains at the base, and rising at the summit into the majestic yellow-pine forests of the Southwest. Within its limits meet plants and animals that represent the desert West and the more humid East, the hot Mexican South and the cool North of the Rockies. It harbors bear, coyotes, the rare peccary or wild pig, a few mountain lions, and an abundance of deer of three species. For these, partial peace has already been secured through the action of the Texas Legislature, which has severely limited the hunting of the most threatened kinds of animals.

Other problems remain for solution: the severe over-grazing of the lowland areas, over-killing of animals still unprotected, vandalism such as the carrying off of cacti by the thousands by collectors for Eastern markets and the misguided setting of "clean-up" fires. But these can without much doubt be adequately met by a combination of police power and public education.

Future visitors will find no lack of scientific oddities to divert as well as educate. There are places where fragments of dinosaur bones fairly pave the earth. There are fossil oyster-shells thirty inches across. There are living rattlesnakes, solemnly vouched for by thoroughly competent and absolutely sober scientists, that flash before your startled eyes in vivid shades of green and pink.

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AGRICULTURE

Find South American Potato Suitable for Arctic

"NONE of the agricultural crops in Europe suffers from such a great number of diseases as the potato," declares Academician N. I. Vavilov, vice president of the Lenin All-Union Academy of Sciences and director of the All-Union Institute of Plant Cultivation. "Hundreds of thousands of centners of potatoes perish every year from various diseases and from cold. At the same time the importance of this crop is growing yearly. Potatoes have become not only one of the staple food and fodder crops, but also a rubber bearing plant, since synthetic rubber is now made from potato alcohol. In the U.S.S.R. the area under potatoes reached 7,000,000 hectares in 1936. It is quite clear how important was the problem of creating varieties of potatoes which will resist disease and cold.

Hardy Potatoes Found

"This problem can now be considered as solved. In the search for new stable varieties of potatoes the All-Union Institute of Plant Cultivation sent a number of scientific research expeditions to South America, the native land of potatoes. During six years, since 1926, the Soviet scientists thoroughly explored vast territories from California down to southern Chile, where a great number of varieties of potatoes, both cultivated and wild, are concentrated. The last of these expeditions was in 1932-1933.

"During the past three years the Institute has studied the collected varieties and in 1935 published an extensive work entitled 'South American Varieties of Potatoes,' summing up the results of our work.

"These results went beyond our boldest expectations. It appears that hitherto Europeans practically have not known potatoes because only a few varieties, brought to Europe from Chiloe island (southern Chile) in the 17th century, have been at their disposal. The entire modern European and North American potato culture originated from these few tubers.

17 New Varieties Discovered

"Around the isolated Indian villages in Ecuador, Peru, Bolivia, etc., our scientists discovered 17 cultivated varieties of potatoes, quite unknown to science, and each was represented by many sorts.

"Besides, a great number of wild varieties have been discovered in Mexico and the Andes, which proved particularly valuable, as they resist phytophthora, the most dreaded disease of potatoes.

"Now, as a result of long experimentation, these varieties have been crossed with the usual potato in the experimental fields of the All-Union Institute of Plant Cultivation, and in 1926 the cross-breeds were sent to the fields of the Soviet collective and state farms.

"In the mountains of Peru and Bolivia, at heights of 4,000-4,500 meters, we found a remarkable wild species of potatoes, *acaule*, which is capable of resisting frost of 8 degrees below zero Centigrade [17 degrees above zero Fahrenheit] and which can be successfully grown in the Transarctic region. Our usual potatoes suffer from the early spring and autumn frosts even in the central belt of the U.S.S.R. (*Turn to next page*)

Resists Disease and Cold

"The Institute is now completing its work on the creation of a new hybrid by means of crossing our varieties with the South American wild varieties. The new cross-breed gives a high yield and resists disease and cold. One of such hybrids is already being cultivated, this year, in Khibiny, in the Transarctic region.

"The cultivated varieties of the Peruvian and Bolivian potatoes, distinguished by their high yield, are also used for crossing with the old European varieties, and a great quantity of the most valuable sowing material has already been evolved.

"These discoveries are literally revolutionizing the selection of potatoes, opening wide prospects for the complete transformation of this important crop.

"A few years will pass," said Academician Vavilov, "and Europe will entirely abandon the old varieties of potatoes, substituting for them new hybrids possessing the most valuable qualities of the wild varieties discovered in the Andes."

Science News Letter, January 30, 1937

GEOLOGY

New Kind of Rupture Found Under Immense Pressure

WHAT happens to those materials which lie buried hundreds of miles deep down in the earth? How may scientists expect them to behave?

It is true that these questions are not of primary importance in our daily life, for it will surely be a long, long time before man has to dig down to such extreme depths for his raw materials. But nevertheless they are not without some practical significance. Many earthquakes are known to have their origin far below the surface.

The main feature of these great depths is the enormous pressure which exists there. One hundred miles down the pressure is almost a million pounds per square inch. It might seem to be asking a lot of laboratory equipment to expect that it should stand any such strain as this.

Prof. P. W. Bridgman of Harvard University, however, has developed apparatus that "can take it." He is able to put a piece of some substance into his machine and then watch what would happen to it if it were a hundred miles under ground.

Prof. Bridgman describes (*Journal of Geology,* September), for the benefit of geologists some of the main features of his findings. The phenomena which he has brought to light are, in general, so complicated as to cause him to remark that "the immediate consequence of their discovery is likely to be embarrassment."

The embarrassed individual is, according to this Harvard physicist, the geologist who would speculate about the effect of underground forces without having a host of facts at his disposal—facts not only concerning just what kinds of materials are involved, but also about the past history of these materials.

The two principal features of high pressure behavior which Prof. Bridgman emphasizes are:

1. The ability of materials to resist "shearing" force is increased many times by very high pressures. Shear is that type of force which tries to make one part of a solid material slide over another part. This means that many substances which were hitherto believed to be flowing like liquids are really behaving in the stiff manner characteristic of solids.

2. The high pressures cause about one-third of all materials to undergo a change of crystalline form. It was formerly believed that such changes were relatively rare.

A new kind of rupture was also disclosed. Usually when a substance is twisted until it breaks it comes apart. Not necessarily, however, when the pressure is high. Prof. Bridgman found that many things would break when twisted, only to take hold again at a new place and be just as strong as ever. He remarked that this type of rupture was likely to be involved in deep-seated earthquakes.

Related to this was found an almost universal tendency for solids to weld fast to one another. When squeezed together hard enough two solids become as a single piece. Under sufficient pressure the molecules of the two pieces come within range of each other's attractive forces and the two pieces lock together.

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*First Glances at New Books

Additional Reviews On Page 80

Gardening

GROW THEM INDOORS, A MANUAL OF HOUSE PLANTS AND THEIR CULTURE—Allen H. Wood—*Hale, Cushman & Flint,* 221 p., illus., $1.75. The revival of interest in house plants makes this manual particularly timely. The most promising species and varieties are described in some detail, with many good halftone plates. Materials and methods for cultivation are also given thorough treatment, with line illustrations that combine diagrammatic instructiveness with attractiveness in design.

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Vegetable Gardening

THE VEGETABLE GARDENER'S HOW BOOK—Chesla C. Sherlock—*Macmillan,* 286 p., illus., $3. Chapters are arranged in alphabetical order, from Asparagus and Beans to Tomatoes and Turnips; then Part II repeats, for the Salad Garden, from Celeriac to Wong Bok (guess what that is!); finally Part III, for Fruits, from Apples to Strawberries. Each chapter is complete, giving information on times to plant and harvest, methods of cultivation, etc.; a very practical method of treatment all round.

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Evolution

MAN IN THE MAKING—Thomas Graves—*Putnam,* 189 p., $2.50. A statement on the front of the cover jacket says: "The real purpose of this work is to try to prove that man did not descend from the ape nor from any other branch of the lower animal kingdom, but has been 'Man in the Making' from the beginning of time, because the proportion of chemical elements in his make-up has always been different from any other animal of his time." The author practiced (simultaneously) law, pharmacy, and telegraphy; his thinking has been much influenced by an early acceptance of phrenology.

Science News Letter, January 30, 1937

Biology

OUR WORLD OF LIVING THINGS—Elwood D. Heiss, Ellsworth S. Obourn, J. Gordon Manzer—*Webster,* 274 p., illus., $1.08. A textbook for high school use, which poses questions, suggests experiments and observation-methods for finding their answers, and makes things clear by means of larger numbers of illustrations than are ordinarily found in elementary biological texts. It can do all this within the compass of its 274 pages by giving them more than twice the spread of ordinary book pages; the volume is set up like a big, old-fashioned, two-column geography book.

Science News Letter, January 30, 1937

Physics

STATISTICAL MECHANICS, THE THEORY OF THE PROPERTIES OF MATTER IN EQUILIBRIUM (2d ed., rev. and enl.)—R. H. Fowler—*Cambridge (Macmillan),* 864 p., $14. Since the first edition of Prof. Fowler's well-known book back in 1929 there has been a revolution in the world of physical science. In the present volume the author catches up with the swiftly shifting scene and produces a most comprehensive treatise which fits the needs of the most advanced physicists and chemists. A "must" book for any departmental library and for those scientists who can afford it personally.

Science News Letter, January 30, 1937

Chemistry

A. S. T. M. STANDARDS ON PETROLEUM PRODUCTS AND LUBRICANTS —*American Society for Testing Materials,* 372 p., $2.

Science News Letter, January 30, 1937

Public Health

DISTRICT HEALTH ADMINISTRATION, A STUDY OF ORGANIZATION AND PLANNING—Ira V. Hiscock—*Science Press,* 115 p., illus., 65c.

Science News Letter, January 30, 1937

Physics

LES ONDES HERTZIENNES ET LA STRUCTURE MOLÉCULAIRE: PT. 1; METHODES D'ÉTUDE DU SPECTRE HERTZIEN, 39 p., 10fr.; PT. 2; ABSORPTION ET DISPERSION DANS LE SPECTRE HERTZIEN APPLICATIONS, 63 p., 15fr. —R. Freymann—*Hermann & Cie, Paris.*

Science News Letter, January 30, 1937

Physics

SPECTRES DE VIBRATION ET STRUCTURE DES MOLÉCULES POLYATOMIQUES —M. Radu Titeica—*Hermann & Cie, Paris,* 68 p., 18fr.

Science News Letter, January 30, 1937

Radio

RADIO FIELD SERVICE DATA (2nd rev. ed.)—Alfred A. Ghirardi—*Radio & Technical Pub. Co.,* 448 loose leaves, $2.50. A looseleaf book on radio service practice designed for ready reference and future expansion.

Science News Letter, January 30, 1937

Chemistry

THE TECHNOLOGY OF PLASTICS; AN INTRODUCTION TO THE COMPOSITION, PREPARATION AND PROPERTIES OF COMMERCIAL PLASTIC MATERIALS FOLLOWED BY A DESCRIPTION OF THE PLANT, PRINCIPLES AND TECHNIQUE USED IN MOULDING THEM—Herbert W. Rowell—*Chemical Pub. Co. of N. Y.,* 206 p., illus., $4. The lengthy title and subtitle of this book leave little to add except that it is British in origin and lacks American references.

Science News Letter, January 30, 1937

Testing Materials

BOOK OF A.S.T.M. STANDARDS, 1936: PART I: METALS, 898 p., illus., cloth $7.50, half leather, $8.50; PART II: NON-METALLIC MATERIALS, 1477 p., illus., cloth $7.50, half leather $8.50 —*American Society for Testing Materials,* set, cloth $14, half leather $16. Every three years the A.S.T.M. collects its adopted standard specifications, methods of testing, definitions and recommended practices; and publishes them. To engineers and applied scientists the book needs no commendation here on its basic usefulness. As always the subject index is complete and provides a way to dive into the mass of material and come up with the answer.

Science News Letter, January 30, 1937

Physics

LE CHAMP MOLÉCULAIRE DANS LES DIÉLECTRIQUES (LE SEL DE SEIGNETTE)—I. V. Kourtschatov—*Hermann & Cie, Paris,* 47 p., 12fr.

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Documentation

MICROPHOTOGRAPHY: An Annotated Bibliography—Ralph H. Carruthers—*Science Service* Document 1006, 28 p., 40c as microfilm, $1.50 as photoprints. This bibliography is issued as a Science Service Document in cooperation with the American Library Association Bulletin. It is modern, historical and international, arranged alphabetically by subject with no author index. The author is connected with the New York Public Library.

Science News Letter, January 30, 1937

Chemistry

COUCHE DOUBLE. ÉLECTROCAPILLARITÉ. SURTENSION—A. Froumkine —*Hermann & Cie, Paris,* 36 p., illus., 10fr.

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•First Glances at New Books

Additional Review On Page 7.

Medicine

EUGENICAL STERILIZATION, A REORIENTATION OF THE PROBLEM—Committee of the American Neurological Assn.—*Macmillan,* 211 p., $3. So much has been written both for and against eugenical sterilization that this unbiased, critical review of the subject should be heartily welcomed and widely read. On finishing the book the reader will probably find himself agreeing with the recommendations of the committee that there is more need at present for continued research than for legislative programs on eugenical sterilization.

Science News Letter, January 30, 1937

Medicine

SNOW ON CHOLERA—John Snow—*Commonwealth Fund,* 191 p., maps, $2.50. The two papers reprinted in this volume are among the classics of medicine and public health. The layman who eagerly reads contemporary accounts of the tracing of an epidemic of amebic dysentery in Chicago to sewage-polluted drinking water in two hotels cannot fail to be impressed with Dr. Snow's account of how, without the aid of modern bacteriology, he traced an epidemic of cholera to its source in polluted water. Included in the volume are a biographical memoir of Snow by one of his contemporaries, Dr. B. W. Richardson, and an introduction by Dr. Wade Hampton Frost, professor of epidemiology at the Johns Hopkins School of Hygiene and Public Health.

Science News Letter, January 30, 1937

Physics

THERMIONIC EMISSION—T. J. Jones—*Chemical Pub. Co.,* 108 p., $1.25. A British radio engineer summarizes the history and applications of the emission of electrons in the vacuum tube art.

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Physics

VERY LOW TEMPERATURES, THEIR ATTAINMENT AND USES—T. C. Crawhall—*H. M. Stationery Office, London,* 30 p., 6 d.

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Metaphysics

PROCEDURES AND METAPHYSICS, A STUDY IN THE PHILOSOPHY OF MATHEMATICAL-PHYSICAL SCIENCE IN THE SIXTEENTH AND SEVENTEENTH CENTURIES—Edward W. Strong—*University of California,* 301 p., $2.50. A valuable summary of the history of physics and mathematics in the period covered. Plentiful notes from original sources supplement each chapter and yet are rightly grouped in the appendix.

Science News Letter, January 30, 1937

Chemistry

AN ELEMENTARY CHEMISTRY—A. H. B. Bishop and G. H. Lockett—*Oxford Univ. Press,* 400 p., $1.75. A British preparatory school chemistry text with early emphasis on the chemical properties of metals.

Science News Letter, January 30, 1937

Fiction, Juvenile

FOR SAFETY!—Ralph Henry Barbour—*Appleton-Century,* 146 p., $1.50. A famous juvenile author (remember *Four Afloat* and *Four Afoot*) uses the method of fiction to emphasize the hazards of traffic, and how high school students start a safety movement that sweeps the town of Brentfield. It would be nice to have organized safety campaigns come off as well as this one did; but despite the literary optimism the book will bring new meaning for traffic safety to thousands of young people.

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Physiology

BEING BORN—Frances Bruse Strain—*Appleton-Century,* 144 p., illus., $1.50. Parents who find it difficult or embarrassing to teach their children about sex or to answer the child's curious questions will be delighted with this really splendid book which does the job for them. It is written for the pre-adolescent child to read himself, and it is about the best of its type that has yet appeared. It is a matter-of-fact presentation, well and suitably illustrated, which will give the young reader all necessary information and also a correct attitude toward the whole subject. Mrs. Strain knows children and the questions they ask and she has the gift of writing simply without writing down to her readers. Parents and teachers may use the book as a guide in sex education but it would be much better to let each child read and, if possible, own it.

Science News Letter, January 30, 1937

Physics

LES DONNÉES SPECTRALES—Guy Emschwiller—*Hermann & Cie, Paris,* 43 p., 12fr.

Science News Letter, January 30, 1937

Engineering

AUDELS DIESEL ENGINE MANUAL—A. B. Green and R. A. Zoeller—*Theo. Audel & Co.,* 292 p., $2. A questions-and-answers type of manual which has a brief table of contents but no index.

Science News Letter, January 30, 1937

Ethnology

INDIANS OF TODAY—edited and compiled by Marion E. Gridley—*Indian Council Fire,* 128 p., illus., $2.50. More readable than most "Who's Who" volumes is this collection of 100 biographies, accompanied in most cases by portraits. With the exception of former Vice-President Charles Curtis all are living Indians with not less than one-quarter of Indian blood. The biographies show that Indians are making names for themselves in art, athletics, administration, and professional work.

Science News Letter, January 30, 1937

Landscaping

ROADSIDES, THE FRONT YARD OF THE NATION—J. M. Bennett—*Stratford,* 233 p., 17 pl., $3. With all America on wheels—in motorcars, buses, and increasingly in trailers—a road has ceased to be simply a means for getting from here to somewhere else, with monotony and boredom to be taken for granted, as dust and flies used to be. Since we live so much of the time on the highway, we are demanding more and more that the highway be also an "eyeway," esthetically pleasing, affording yet not obtruding modern conveniences, ameliorating climatic discomforts. In all these things highway landscaping and engineering play prime roles; Mr. Bennett here tells administrators how they may be carried out efficiently, and the public how they may be appreciated when present, promoted when not.

Science News Letter, January 30, 1937

Gardening

SHAKESPEARE GARDENS, DESIGN, PLANTS, AND FLOWER LORE—Annie Burnham Carter—*Dorrance,* 85 p., $1.25. Shakespeare's many mentions of flowers and other plants, both wild and gardenable, are taken up in order, described briefly, literary references given, backgrounded with the English plant lore that was most of Shakespeare's botany and horticulture. The author tells how to cultivate each kind of plant, and also devotes a special chapter to designing a Shakespeare garden.

Science News Letter, January 30, 1937